Ten Catholic scientists and inventors everyone should know

Left to right: Augustinian friar and biologist Gregor Mendel; Pope Sylvester, II (in blue) as depicted in the 'Gospels of Otto III'; French Catholic pro-life paediatrician and geneticist Jerome Lejeune. (Images: Wikipedia)

July 22nd marks the two-hundredth anniversary of the birth of Gregor Mendel, the Austrian Augustinian friar known as the father of genetics. While the dominant narrative in the West since the Enlightenment has been that religion is obscurantist and hostile to science, until the twentieth century, it was in the Christian West where the most important scientific discoveries took place. Indeed, Europe's (and the world's) oldest and most prestigious universities – in Bologna, Oxford, Paris – began as Church institutions.

Here is a list — by no means exhaustive — of ten Catholic scientists and inventors whose discoveries have revolutionized our lives.

1). Pope Sylvester II (946-1003)

Here's a factoid to impress the guests at your next cocktail party: the mechanical clock was invented by a pope. Before his election as pope in 999, the Frenchman

Gerbert of Aurillac was a Benedictine monk who went to Spain, then under Arab domination, to study mathematics. There, he learned the Hindu-Arabic digits. Later, Gerbert introduced the decimal system and reintroduced the forgotten abacus to Europe. In 996, he constructed the first pendulum-driven clock for a tower in Magdeburg, Germany.

Apart from his mathematical and mechanical accomplishments, Sylvester II also contributed to the moral renewal of the priesthood, campaigning against concubinage and the selling of ecclesiastical offices, widespread practices among the clergy in his time. In his view, a priest should set a moral example to his flock.

The atheist philosopher Bertrand Russell (1872-1970) wrote that religion "helped in early days to fix the calendar, and it caused Egyptian priests to chronicle eclipses with such care that in time they became able to predict them. These two services [of religion] I am prepared to acknowledge, but I do not know of any others."

Russell's statement reveals embarrassing (or willful?) ignorance and prejudice. In the narrow field of the measurement of time, where Russell recognizes religion's sole positive achievements, the significance of Sylvester II's invention of the clock is arguably at least as important as that of the priests in ancient Egypt.

Meanwhile, what Pope John Paul II said of his predecessor, the scholar-pope Sylvester II, applies to each of the faith-filled men of science on this list:

> [Pope Sylvester II] reminds us that intelligence is a marvelous gift from the Creator. His intellectual and spiritual attitude is a call to the pastors and the faithful of the present age: go in search of the truth; find inner strength in prayer; be concerned for the moral search and serve mankind.

2). Nicolaus Copernicus (1473-1543)

Like Leonardo da Vinci, Nicolaus Copernicus was a true Renaissance man, a many-gifted polymath. He was a noted economist, mathematician, physician, Church canon, and diplomat, but he is best known for his contributions to astronomy. In his famous work *De revolutionibus orbium coelestium* ("On the Revolutions of Heavenly Spheres"), Copernicus debunked the dominant Ptolemaic model according to which the earth was at the center of our galaxy; instead, Copernicus

correctly pointed out that the earth and other planets revolve around the sun.

Copernicus worked as a canon at various churches. His uncle, Lucas Watzenrode the Younger, was the Bishop of Warmia and defended Poland and the Baltics against the Teutonic Order, an order of hospitaller knights founded during the Crusades who routinely violated the Fifth Commandment in converting pagans to Christianity. Copernicus dedicated *De revolutionibus orbium coelestium* to Pope Paul III. Jan Matejko's famous painting *Astronomer Copernicus, or Conversations with God,* beautifully depicts Copernicus' dual role as a man of faith and science.

3). Galileo Galilei (1564-1642)

It might seem provocative to add Galileo to this list. After all, the Florentine astronomer was sentenced to house arrest by the Inquisition for insisting on the heliocentric model. Arguably, no other historical event is used to illustrate the alleged incompatibility of science and religion more than his trial.

As Protestantism spread across Europe, Pope Paul III instituted the Roman Inquisition to protect the faithful from error. Paul III himself accepted the Copernican model. However, Jesuit astronomers would convince later popes that it was erroneous. Indeed, science would confirm the heliocentric model only in 1729. In 1616, the Inquisition declared the notions that the sun is at the center of our galaxy and that the earth revolves around it to be "foolish and absurd" and demanded that Galileo not teach the heliocentric model publicly. The Florentine consented, but he did not keep his promise. Eventually, the Inquisition found him guilty of heresy and sentenced him to spend the rest of his life under house arrest.

To be sure, Galileo's house arrest was in a gilded cage, as he was allowed to reside in his villa, one of the most opulent in all Florence, with his servants. However, he was unfairly mistreated by the Church for declaring what science would prove true. It was only in 1992 when John Paul II, who on many occasions publicly apologized for the sins of the people of the Church across the centuries, rehabilitated Galileo. (The background and complexity of Galileo's case is examined in detail in *Galileo Revisited: The Galileo Affair in Context* by Dom Paschal Scotti.)

4). André-Marie Ampère (1775-1836)

The amp, the base unit of electrical current, was named after André-Marie Ampère, one of the fathers of electromagnetism. This French scientist discovered that a wire carrying an electric current can attract or repel another current-

carrying wire, thus generating a magnetic field. This paved the way for the later discovery of electromagnetic radiation, which made possible inventions that we now take for granted, including the radio, microwave, and X-rays.

Ampère was a devout Catholic. While studying at the Sorbonne, the scholar Frédéric Ozanam, later beatified, was going through a period of doubt. One day, he wandered into a parish church in a Paris slum where he unexpectedly saw none other than André-Marie Ampère, one of the most famous scientists of the time, on his knees praying.

“Professor, I see you believe in prayer,” Ozanam said.

“Everyone has to pray,” Ampère replied. This was a turning point in Ozanam’s conversion.

5). Louis Braille (1809-1852)

Fiddling around with tools in his father’s tannery, the three-year-old Louis Braille accidentally stabbed his eye with an awl. This led to an infection, which eventually spread to both eyes and left him completely blind.

Being blind before the invention of the Braille alphabet made learning extremely difficult. Books written for the blind at the time consisted of clumsy, bulky raised letters. Yet Louis Braille excelled in his studies and, at the age of ten, went to Paris to study at one of the world’s first schools for blind children. He wanted to make the alphabet for the blind easier and more accessible, and so he created a system based around raised dots, inspired by a similar secret system of communication used for communication between troops on the front. Braille’s alphabet was mostly completed when he was just fifteen.

A devout Catholic, Braille loved liturgical music and earned his living as an organ player at churches all over France.

6). Gregor Mendel (1822-1884)

Gregor Mendel was born to a poor peasant family in Heinzendorf bei Odrau, presently Hynčice in the Czech Republic. While Mendel was motivated to join the monastic life in part to escape the grinding poverty of his youth, Father Clemens Richter, OSA, his great-great-grand-nephew and a fellow Augustinian friar, writes that his famous relative did have a sincere religious faith:

> Mendel was deeply rooted in his Christian faith, and he passionately tried to convey his conviction and experience to others at any given occasion. Testimony of this attitude is shown in various outlines of sermons that are still preserved.

Initially, Mendel experimented with the principles of heredity on mice. But his prior was disgusted by the notion of studying the copulation of animals, so Mendel switched to pea plants. After many long hours spent on crossbreeding them, Mendel came up with the basic principles of the inheritance of recessive and dominant alleles, which are now illustrated in probably every single high school biology textbook. Later, Mendel would become the prior of his abbey.

Mendel presented a paper on inheritance at a meeting of the National History Society of Brno in 1865, six years after Charles Darwin had published his *On the Origin of Species*. Darwin was aware neither of the paper nor of the notion of genes, yet evolutionary science does not make sense without genetics. Mendel was ignored by the scientific community in his life, and his work gained recognition only sixteen years after his death.

7). Louis Pasteur (1822-1895)

Very few nineteenth-century scientists left such a lasting impact on our world as Louis Pasteur. He is considered the inventor of vaccines (such as for rabies), which in the twentieth century would prove critical in eliminating many other diseases. Thanks to the polio vaccine, for instance, poliomyelitis is all but obsolete except for in Afghanistan and Pakistan.

Pasteur also discovered pasteurization, the process by which germs are eliminated from food and can therefore be preserved for longer. He is one of the discoverers of germ theory of disease, by which physicians understand the mechanisms of the contraction of maladies.

According to an oft-told story (I recall hearing it during a priest’s sermon at one Mass years ago), Pasteur was praying the rosary on the train one day. His neighbor in the compartment, unaware of his interlocutor’s identity, criticized the old man for believing such superstition and said he would like to mail him some books disproving the existence of God. Pasteur told the youth to send him these materials to his address and pulled a business card out of his coat pocket. The young man was stunned that he had arrogantly lectured one of the true greats of science. Epic fail.

I do not know if this story is authentic or apocryphal, but it illustrates Louis Pasteur's ardent faith well.

8). Guglielmo Marconi (1874-1937)

Guglielmo Marconi, the inventor of the radio and the winner of the 1909 Nobel Prize in Physics, was born to an Italian aristocrat and his Irish Protestant wife. Although baptized a Catholic, he had been raised an Anglican; he received the sacrament of confirmation in the Catholic Church so he could marry his wife, Maria Cristina Bezzi-Scali. It was then that he became a zealous Catholic.

Another Catholic played a key role in Marconi's invention of the radio: Thomas Edison informed Marconi of the experiments of Father Jozef Murgaš, a Slovak priest living in Pennsylvania, who contributed to the wireless transmission of the human voice.

In 1931, Marconi set up Vatican Radio for Pope Pius XI; this was the first radio station that was used to preach the Good News. One year later, he invented a short-wave radio telephone to facilitate communications between the Vatican and the papal summer residence at Castel Gandolfo, an early predecessor to the cellular phone.

Unfortunately, there is a dark side to Marconi. He was a member of the Fascist Party, and growing evidence suggests he supported Mussolini's anti-Jewish policies. Yet despite these obvious flaws, Marconi was a perfect example of a scientist who used his discovery for the good of the Church.

9) Georges Lemaître (1894-1966)

A few years ago, I was strolling through a park and overheard two teenaged girls talking. "I'm not sure if I believe in God or the Big Bang," one said to the other.

I regret not interrupting their conversation and pointing out that the Big Bang theory had been formulated by Georges Lemaître, a Catholic priest from Belgium and professor of physics at the Catholic University of Louvain.

Before Lemaître, not all physicists believed the universe had a definite beginning. However, he argued that it had expanded from a "primeval atom." While the notion of a specific point marking the beginning of existence was consistent with the account of Creation proposed by Judaism and Christianity, Lemaître believed that the Big Bang theory contradicted neither theism nor atheism.

Lemaître applied Albert Einstein's theory of general relativity to cosmology. The priest was among the first scientists to propose that the universe is expanding, a view initially rejected by Einstein himself; he was nominated for the Nobel Prizes in Physics and Chemistry. In 1960, Pope John XXIII gave him the honorary title of Monsignor.

10) Jérôme Lejeune (1926-1994)

In today's West, there is a growing inconsistent tendency to, on the one hand, promote the greater inclusion and empowerment of people with physical and intellectual disabilities but, on the other, to lobby for their widespread killing in the womb. In Iceland, for example, nearly 100 percent of unborn children diagnosed with Down syndrome during neonatal testing are aborted.

The French geneticist and pediatrician Jérôme Lejeune compassionately worked with children with disabilities. In 1958, he discovered that Down syndrome is caused by an extra copy of chromosome 21. Previously, scientists had believed that Down syndrome was caused by syphilis, alcohol abuse by the mother, or genes of Asian origin (hence the now-archaic terms "Mongolism" and "Mongoloid").

In the 1960s and 1970s, Lejeune vocally opposed the legalization of abortion in France and many other Western countries. He wrote: "One cannot protect another from misfortune by committing a crime. And killing a child is murder. You cannot bring relief to one person by killing another." Lejeune bitterly (but accurately) noted that his pro-life advocacy would prevent him from winning the Nobel Prize in Physiology or Medicine.

Lejeune was a long-time friend of Pope John Paul II, who as the Archbishop of Krakow invited him to give lectures. During his 1997 visit to France for World Youth Day, the Polish pope prayed at the French scientist's tomb.

Currently, Lejeune's cause for beatification has advanced. Last year, Pope Francis declared him Venerable, meaning that he will be officially recognized as blessed once a miracle through his intercession is approved.

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